

Importance of Invention

Prior to addressing the substantive rejections, applicant wishes to summarize the evolution of the art, and note the importance of applicant's invention:

- (1) Early art taught sequential injection of a solution of the polymeric gel components;
- (2) with an improvement being formation of a single aqueous gelation solution at the surface;
- (3) with a further improvement being surface formation of a gelation solution to which the fibers are then added; and
- (4) as applicant's further evolution, the claimed invention is directed to a dry mix of the polymeric gel components and fibers.

Notice that (1), (2) and (3) all involve solutions rather than applicant's dry mix.

As applicant noted in the Specification at page 7, beginning on line 9, making multi-component well fluids at a well site requires "mixing the fibers with the polymer solution requires a multiplicity of storage and mixing tanks, and a metering system which must be operated during the operation of the well." As further explained, "a first tank will store a water and polymer solution, a second tank will store a water and cross-linking solution, and a third tank will be used to mix fibers with polymer solution from the first tank to create a polymer/fiber

slurry. This polymer/fiber slurry is then metered from the third tank and combined with cross-linking solution metered from the second tank to the well bore."

Sydansk (U. S Patent 4,989673) mentions the operational problem of "on-site preparation in the field where process controls are often imprecise, such as remote hostile onshore and offshore locations." (col. 2, lines 42-45).

The applicant respectfully notes that a major importance of this invention is that it does not require in-field measurement and mixing of individual components. The dry mix allows pre-mixed proportions of: crosslinkable polymer, crosslinking agent, and reinforcing material. All that workers in the field must do is add water and mix.

1st Rejection Under 35 USC 103(a)

6. Claims 1, 2 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,989,673 to Sydansk (hereinafter referred to as Sydansk '673). The rejection is respectfully traversed.

The applicant agrees with the Office action "that Sydansk does not appear to teach a dry mixture of water soluble crosslinkable polymer, crosslinking agent, and reinforcing material." See, Office action at 5.

Regarding applicant's optional embodiment that either the polymer or crosslinking agent may be utilized as a solution, applicant respectfully notes:

- (1) the claims require a "dry mix";
- (2) this is an unclaimed embodiment that should have no bearing on the claims.

Regarding whether the Sydansk conformance fluid and a conformance fluid made with applicant's "dry mix" are the same, applicant respectfully notes:

- (1) claims 1-10 are directed to an additive comprising a "dry mix" not to a conformance fluid - Sydansk does not disclose or teach such a "dry mix";

(2) claims 11-13 are directed to a method of making a conformance fluid with the "dry mix" and affords ease and simplification of making as compared to Sydansk. This dry mix reduces chances in errors in formulation of the fluid. Please see the discussion concerning the "Importance of the Invention," above.

2nd Rejection Under 35 USC 103(a)

7. Claims 1-4, and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,377,760 to Merrill (herein referred to as Merrill '760). The rejection is respectfully traversed.

In response, applicant respectfully notes that claims 1-4, and 7 are patentable over Merrill '760 at least by the required "dry mixture" of crosslinkable polymer, crosslinking agent, reinforcing agent.

In sharp contrast, Merrill teaches the formation of a gelation solution to which the fibers are then added (i.e. fibers are added to "wet" polymer):

See, abstract, "fibers are added to a gelation solution;"

See, col. 2, at 42-43, "introducing reinforcing fibers into the gelation solution;"

See, col. 2, at 52-53, "quantity of fibers introduced to the gelation solution;"

See, col. 3, at 10-12, "the invention contemplates the incorporation of fibers in a gel by mixing the fibers with the gelation solution at the surface;"

See, col. 7, at 7-9, "results further confirm the increased strength produced by adding reinforcing fibers to the gelation solution prior to injection;"

See, col. 7, at 15-18, "mixing the fibers with the gelation solution and injection the resulting mixture;"

See, col. 7, lines 4-48, "fibers are simple to introduce into the gelation solution;" and

See, claim 1, which requires first "providing a gelation solution" and then "introducing reinforcing fibers . . . into the gelation solution."

3rd Rejection Under 35 USC 103(a)

Claims 1, 2 and 5-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,004,553 to House et al (herein referred to as House et al '553) in view of U.S. Patent 3,208,524 to Horner et al (herein referred to as Horner et al '524). The rejection is respectfully traversed.

In response, applicant respectfully notes that claims 1,2, and 5-13 are patentable over House et al '553 in view of Horner et al '524 at least by the required "dry mixture" of crosslinkable polymer, crosslinking agent, and reinforcing material.

It is respectfully noted that House et al '553 teaches that the "additive of this invention [is] added to the well working fluid" (col. 5, lines 63-64) (parenthetical and emphasis added). Therefore, House's '553 additive is added to a previously formed fluid and is not part of a dry mixture.

It is respectfully noted that Horner '524 also does not begin with a dry mixture, but instead teaches "The gel is formed by mixing the cross linking agent into the polysaccharide solution" (col. 5, lines 14-15) (emphasis added). Also, Horner '524 teaches "a bulking agent may be incorporated into the polysaccharide solution before the gel is formed or may be added after it has been formed" (col. 5, lines 43-44) (emphasis added).